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MENT OF

To: Mr. Patrick Burns
Expansion Project Manager
City Market
82 S Winooski Ave
Burlington, VT 05401

Date: July 27, 2016

Memorandum

Project #: 57843.00

From: David Saladino, PE, AICP
Director, Transportation Systems &
Nick Sanders, PE
Senior Traffic Engineer

Re: Proposed City Market/Onion River Co-op (South End)
Traffic Impact Study (UPDATED)
Flynn Avenue - Burlington, VT

VHB has completed a traffic impact study (TIS) for the proposed City Market/Onion River Co-op grocery store to be located on the southwest corner of Flynn Avenue and Briggs Street in Burlington, Vermont. The site, which currently consists of several buildings including Upstairs Antiques, Evergreen Roofing, and rail transload facilities, has numerous full access/egress points on both Flynn Avenue and Briggs Street.

The proposed redevelopment program consists of demolishing the existing structures and constructing a 33,874± square foot City Market grocery store with associated uses. The scope of work for this evaluation is generally limited to Flynn Avenue and Briggs Street in the vicinity of the site and includes the intersections of Pine Street at Flynn Avenue, Briggs Street at Flynn Avenue, the proposed site driveway access to Flynn Avenue, and the intersection of Flynn Avenue and the Champlain Parkway in the future condition.

This memorandum includes the following:

- A description of the existing roadway network in the vicinity of the site;
- A summary of the crash data within the study area;
- A description of the proposed development program;
- A trip generation estimate for the proposed development program;
- An evaluation of anticipated traffic changes in the adjacent residential neighborhood;
- An evaluation of traffic operations within the study area; and
- Conclusions and recommendations to support the project.

EXISTING CONDITIONS

The site is located on the southwest corner of the Flynn Avenue and Briggs Street intersection in the South End of Burlington, Vermont. Currently, three full access/egress curb cuts are located on Flynn Avenue and three additional full access/egress driveways are located on Briggs Street. The location of the site in relation to the local roadway network is shown in **Figure 1**.

Flynn Avenue and Briggs Street are both straight and level in the vicinity of the site and provide adequate sight lines. Specifically, Flynn Avenue provides a clear line of sight over 800 feet west of the site driveway and over 500 feet east of the site driveway. Briggs Street provides a clear line of sight to and from Flynn Avenue (approximately 375 feet north of the site driveway) and to and from Morse Place (approximately 675 feet south of the site driveway). These sight lines on Flynn Avenue and Briggs Street exceed the American Association of State and Highway Transportation

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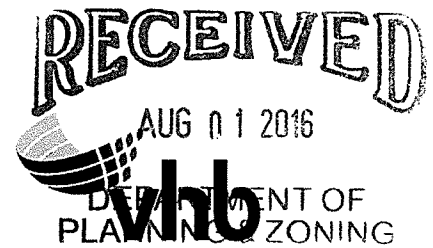
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0 500 1000 Feet



Figure 1
Site Location Map



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Officials (AASHTO) recommended guidelines for stopping sight distance (SSD) of 155 feet and intersection sight distance (ISD) of 280 feet (for a 25 mph roadway).

Flynn Avenue is a two-lane roadway (one lane in each direction) that provides an east-west connection between US 7 (Shelburne Road) to the east and Oakledge Park on Lake Champlain to the west. The posted speed limit along Flynn Avenue is 25 miles per hour (mph). A sidewalk is provided along the northern side of Flynn Avenue between Pine Street and Oakledge Park. On the south side of Flynn Avenue a sidewalk is provided between the site (just east of Briggs Street) and US 7. Land uses along Flynn Avenue are a mix of commercial, light industrial, and residential.

Pine Street is a two lane roadway (one travel lane in each direction) that provides a north-south connection between Downtown Burlington and Queen City Park Road in Burlington's South End. Sidewalks are provided along both sides of Pine Street. Pine Street accommodates cyclists with "bike route" and "share the road" signage along the northbound travel lane and a bike lane adjacent to the southbound travel lane (north of Flynn Avenue). A sheltered bus stop is located on the west side of Pine Street just north of Flynn Avenue with regularly scheduled service provided by Chittenden County Transit Authority (CCTA). Land use along Pine Street is a mix of commercial and residential. The posted speed limit along Pine Street is 25 mph.

Flynn Avenue and Pine Street intersect to form a 4-way signalized intersection. Flynn Avenue provides a single multi-use lane in both the eastbound and westbound directions. Pine Street provides a left-turn lane and a shared through/right lane in the southbound direction and a single multi-use lane in the northbound direction. Pedestrians are accommodated with crosswalks on all four intersection approaches and concurrent pedestrian phases.

Briggs Street and an offset commercial driveway for 208 Flynn Avenue intersect Flynn Avenue from the south and north respectively to form a 4-way unsignalized intersection. Flynn Avenue provides a single multi-use lane in both the eastbound and westbound directions. Briggs Street and the commercial driveway operate as the minor street approaches (although there are currently no stop signs) with single multi-use lanes in both the northbound and southbound directions. The north side of Flynn Avenue has both head-in angled parking and parallel parking spaces.

CRASH SUMMARY

A review of VTrans' most recent High Crash Location (HCL) Report (2010 – 2014) revealed that no intersections or roadway segments within the project study area were classified as a HCL by VTrans. Additional crash data provided by VTrans were compiled and evaluated within the project study area. The detailed crash data covers the most recent 5-year period available: January 1, 2010 through December 31, 2014. The primary study area intersection is summarized below and the detailed VTrans crash summaries are included in the Appendix.

The intersection of Pine Street at Flynn Avenue experienced 39 crashes over the 5-year period for an average of 8 crashes per year. Of these 39 crashes, 10 (26%) were broadside crashes, 8 (21%) were rear-end crashes, 5 (13%) were right-turns with through movement crashes, 5 (13%) were same direction sideswipe crashes, 4 (10%) were opposite direction sideswipe crashes, 1 (3%) was a head on crash, and 6 (15%) crashes were classified as other or unknown. One of the crashes reported during this 5-year resulted in a fatality and 4 crashes resulted in injury.



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Only one crash was reported at the intersection of Flynn Avenue at Briggs Street during the 5-year period. This crash was caused by a motorist failing to yield the right-of-way and resulted in property damage only.

DEVELOPMENT PROGRAM

The proposed redevelopment program consists of demolishing the existing structures on site and constructing a 33,874± square foot City Market grocery store with associated uses. Primary access and egress is provided via a driveway on Flynn Avenue located approximately 225 feet west of Briggs Street. Emergency vehicle access is provided via a gated entrance off of Briggs Street approximately 500 feet south of Flynn Avenue. The proposed layout of the project is shown in **Figure 2**.

TRIP GENERATION

Trip generation estimates for the proposed City Market grocery store were calculated using rates published by the Institute of Transportation Engineers (ITE) Trip Generation¹ (Land Use Code 850 – Supermarket) for the weekday evening peak hour as that period reflects the peak period for both the proposed grocery store and the surrounding street network. It should be noted that the ITE average rate is slightly higher than Vermont-specific trip generation rate published by ITE in the June 2012 ITE Journal. Using the more conservative national ITE average rates, the proposed development is expected to generate approximately 320 total trips across all modes (165 entering and 155 exiting) during the weekday evening peak hour. City Market anticipates that the store will generate approximately 30 truck delivery trips per week, with the majority of the deliveries occurring between 6:00 AM and 10:00 AM. These truck trips are incorporated into the overall trip generation estimates provided below.

Table 1 summarizes the trip generation estimates for the proposed development. Calculations supporting the proposed trip generation estimates for the project are provided in the Appendix.

TABLE 1: TRIP GENERATION SUMMARY

Peak Period	Proposed City Market Grocery Store – Site Generated Trips				
	Total	Non-Auto (Walk/Bike/Transit)	Pass-By (Briggs St/Flynn Ave)	Diverted (Pine St/US 7)	New
Weekday PM Peak Hour (vph)	100%	20%	5%	35%	40%
Enter	165	30	10	55	65
Exit	155	30	10	55	65
Total	320	60	20	110	130

vph = vehicles per hour.

Non-Auto trips are based on "Food Shopping in the Urban Environment: Parking Supply, Destination Choice and Mode Choice", (TRB 2011 Annual Meeting, Moley and Weinberger).

Pass-by and Diverted trip percentages are based on "Trip Generation Handbook" by ITE.

¹ Trip Generation 9th Edition, Institute of Transportation Engineers, Washington D.C., 2012.

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PROGRESS SET
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DEPARTMENT OF
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SE GROUP
101 Church Street
Burlington, VT 05401
Tel: 802.486.1100
Fax: 802.486.1101

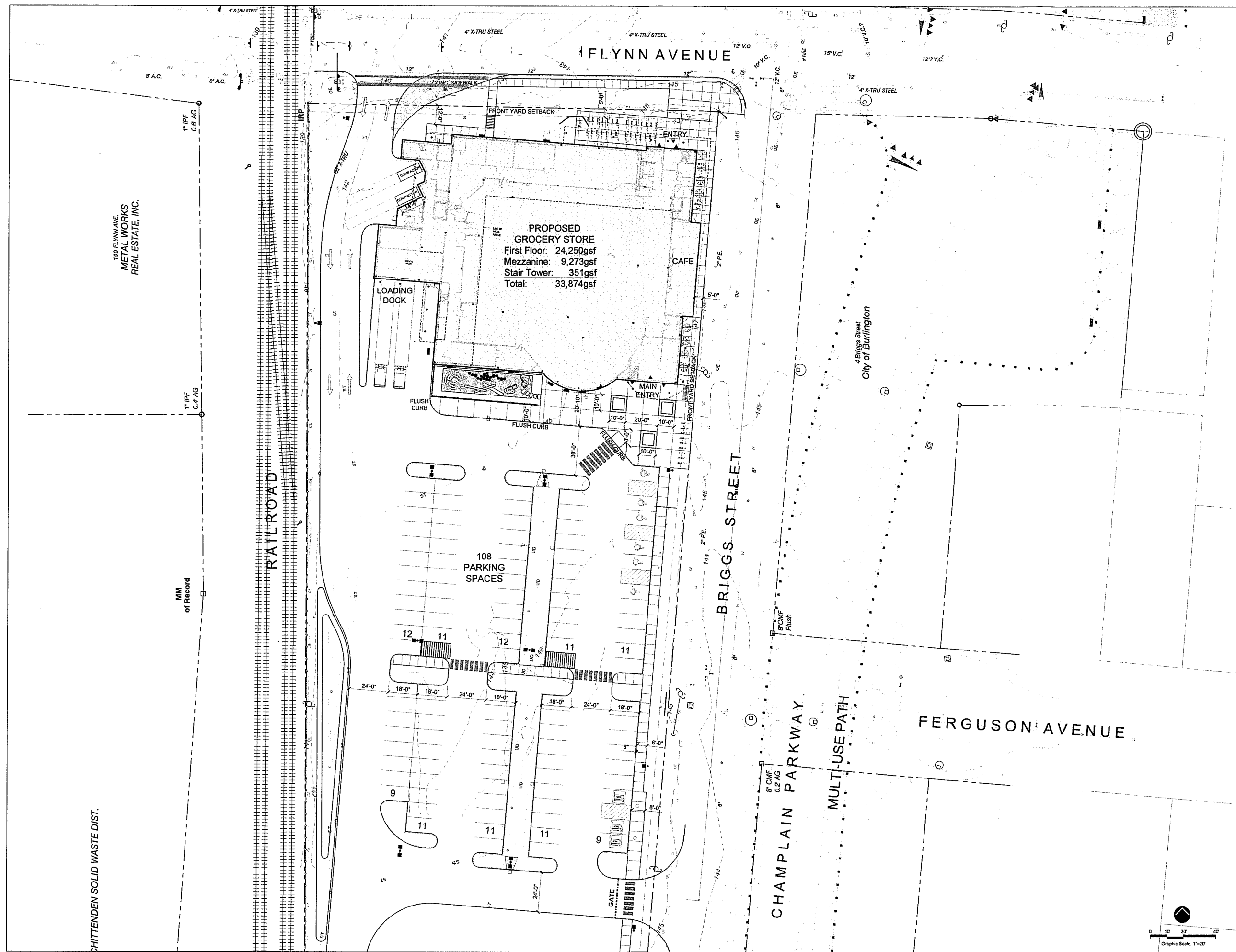
CITY MARKET
SOUTH END

Burlington,
Vermont

PROJECT NO.	A1536.00
DATE	04/22/16
SCALE	1"=20'
DESIGNER	MW
DATE	02.12.2014
DESIGNER	04.15.2014
DATE	04.22.2016
DESIGNER	04.22.2016
DATE	04.22.2016

LAYOUT PLAN

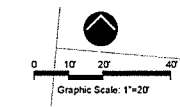
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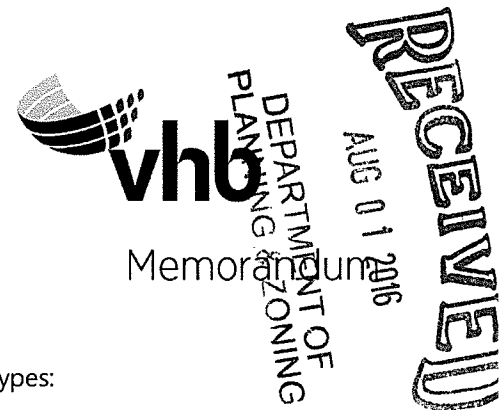


199 FLYNN AVE
METAL WORKS
REAL ESTATE, INC.

MM
of Record

CHITTENDEN SOLID WASTE DIST.





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The trip generation estimate includes the effects of the following four specific trip types:

- 1) Non-automobile trips are trips that do not utilize a personal automobile, such as walkers, bicyclists, and transit users.
- 2) Pass-by trips are those that are already on the adjacent streets (i.e. Flynn Avenue, Briggs Street) and are drawn to the store from the passing traffic stream.
- 3) Diverted trips are those that are drawn from nearby roadways (e.g. Pine Street or US 7) that are not directly adjacent to the store.
- 4) New trips are defined as trips whose primary origin or destination is the proposed development.

The amount of pass-by and diverted traffic for the project was determined based on rates published by the ITE in the Trip Generation Handbook². Non-automobile trips were estimated from data published in "*Food Shopping in the Urban Environment: Parking Supply, Destination Choice and Mode Choice*" (TRB 2011 Annual Meeting, Maley and Weinberger).

As a further trip reduction measure, City Market does not offer onsite employee parking and offers free bus passes (up to the cost of a monthly unlimited pass) to encourage employees to use other modes of transportation to commute to and from work. In addition, City Market reimburses employees up to \$240 per year for bike commuting expenses. Despite these additional employee trip reduction measures taken by City Market, no further reduction in automobile trips was applied during the traffic analysis to provide a conservative evaluation.

No reduction in background traffic was made to account for the elimination of the existing site-generated uses, including the Barrett Trucking salt-related trips, making the traffic assessment that follows even more conservative.

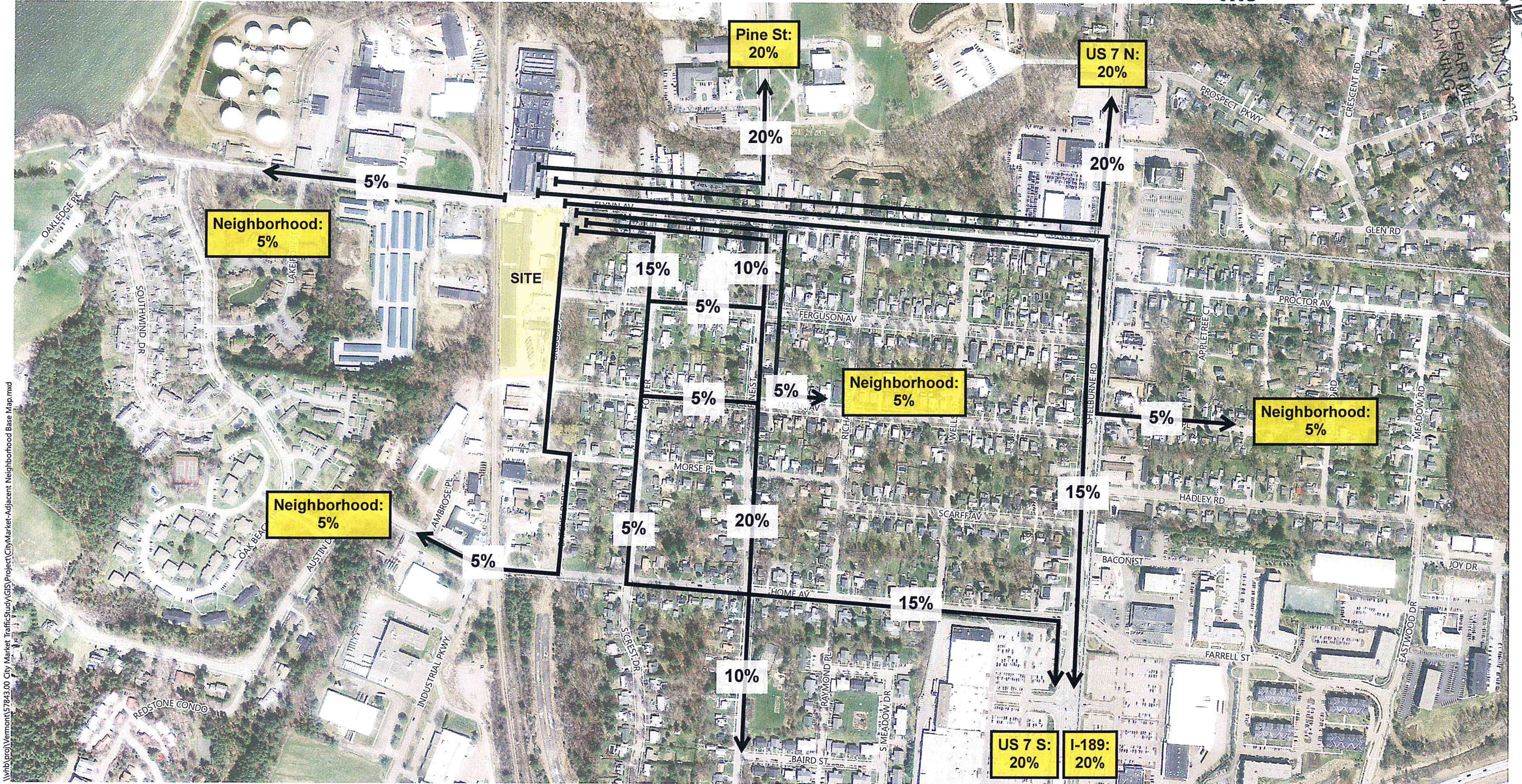
TRIP DISTRIBUTION

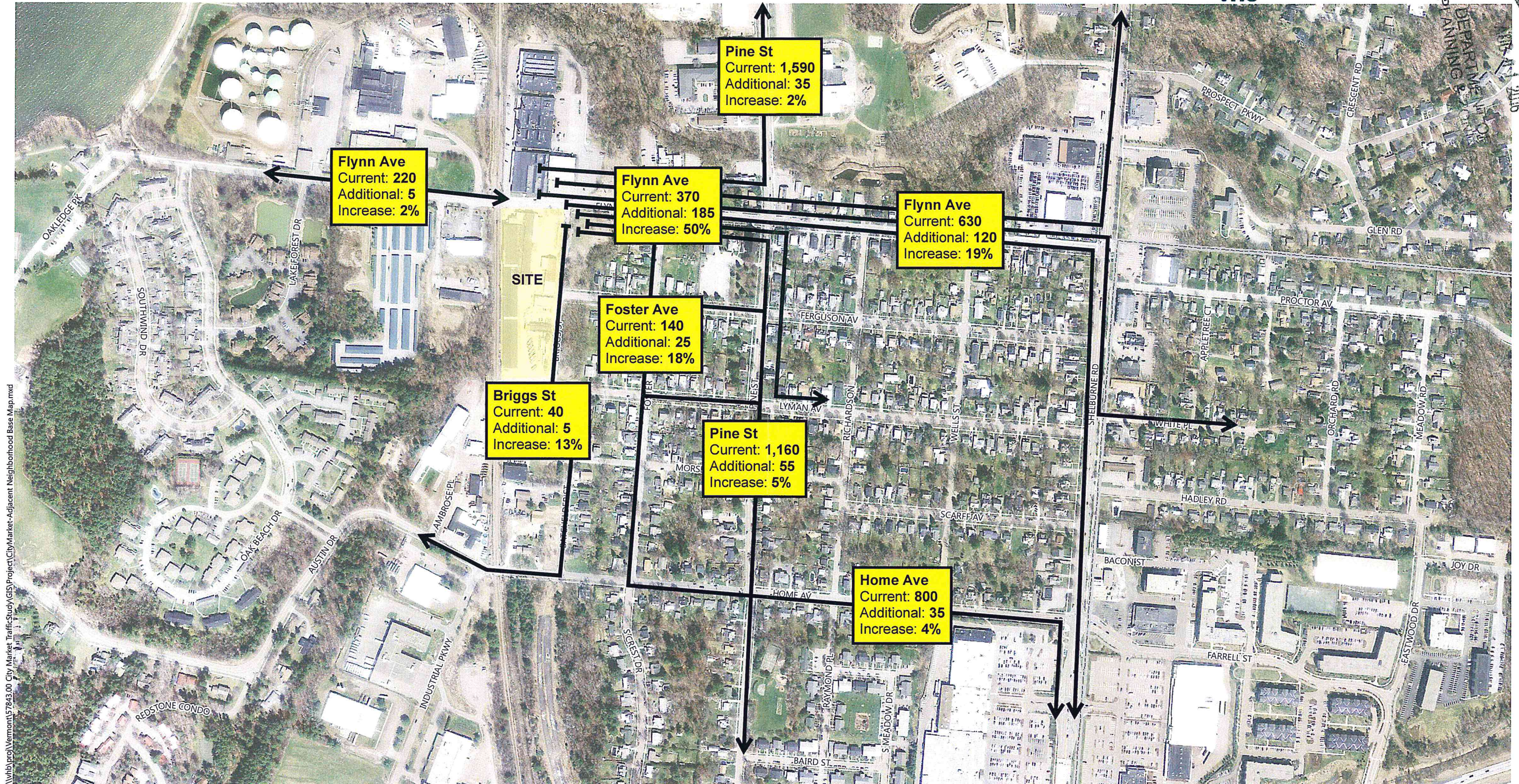
The site-generated trips were distributed onto the adjacent street network based on a combination of background traffic patterns, an understanding of route preferences and potential "short-cut" routes, travel time measurements, and engineering judgement.

Figure 3 shows the anticipated distribution of site-generated trips prior to the construction of the Champlain Parkway. The yellow boxes on the figure represent the estimated percentage of site-generated trips headed to or from that particular zone. For example, the combination of the US 7 south and I-189 zones are estimated to be a source or destination for 40% of the site-generated trips. 15% of these trips are assumed to travel Shelburne Road to Flynn Avenue, 15% are assumed to travel via Home Avenue, and the remaining 10% are assumed to use Pine Street and Queen City Park Road to reach Shelburne Road south of the I-189 interchange.

Figure 4 shows the anticipated pre-Parkway trip distribution with the following additional detail provided on several adjacent streets: 1) the existing weekday evening peak hour traffic volume, 2) the number of additional site-generated

² Trip Generation Handbook, 2nd Edition - Institute of Transportation Engineers, Washington D.C., 2004.





\\vhb\proj\Vermon\57843.00 City Market Traffic Study\GIS\Project\CityMarket-Adjacent Neighborhood Base Map.mxd

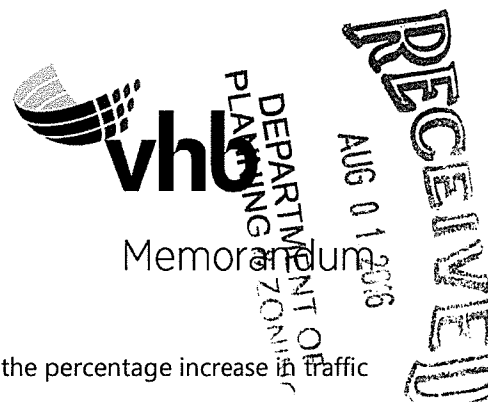


City Market Traffic Study

Burlington, Vermont

Sources:
Background Imagery by VCGI (2013)
VCGI (Vermont Center for Geographic Information - 2012)
VTrans (Vermont Department of Transportation - 2014)
VHB - 2016

Figure 4
Trip Distribution
Change in Weekday Evening
Peak Hour Volumes



trips anticipated to travel that street during the weekday evening peak hour, and 3) the percentage increase in traffic resulting from the City Market trips.

The addition of the Champlain Parkway to the area creates a more direct and faster route for certain trips to and from the north of the City Market site and for most, if not all, of the trips to and from I-189, Shelburne Road and points south. The anticipated distribution of site-generated trips with the Champlain Parkway in place is shown in **Figure 5**. As shown, the Champlain Parkway is expected to remove most of the site-generated traffic traveling through the adjacent neighborhoods (as well as a significant portion of existing background through traffic as well).

TRAFFIC NETWORKS

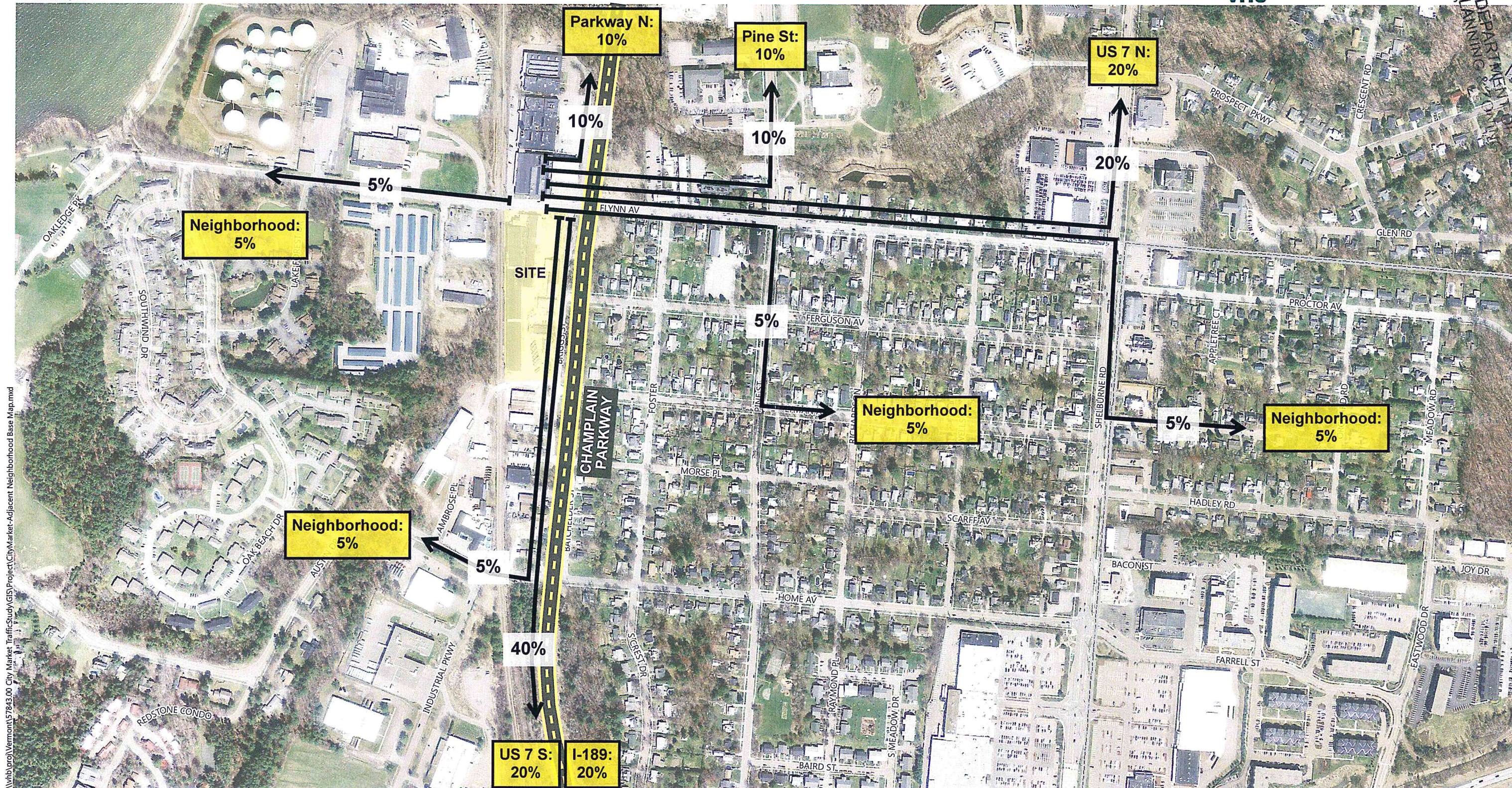
Turning movement traffic counts collected by the Chittenden County Regional Planning Commission (CCRPC) at Pine Street and Flynn Avenue in June of 2014 and by VHB at Flynn Avenue and Briggs Street in January of 2016 during the weekday evening peak period were used as the basis for this evaluation. To evaluate the impact of the proposed development within the study area, the 2014 and 2016 peak hour traffic volumes counts were projected to the opening year (2017) of the development and a 5-year forecast horizon (2022). Copies of the traffic volume count data are provided in the Appendix.

Seasonal Variation

Since it is impractical to design for the highest volume encountered during the year, VTrans guidelines recommend a compromise between capacity and cost. Design Hourly Volume (DHV) criteria allow roads to be designed for the 30th highest hourly volume of the year. Historical data from the closest, most comparable VTrans continuous count stations located on VT 127 in Burlington (P6D001), US 7 in Colchester (P6D040), and US 2 in Williston (P6D061) were reviewed to establish an appropriate DHV condition. The majority of the 30th highest hours at these three count stations occurred during the weekday evening peak hours, indicating that a weekday evening DHV condition is appropriate. As such, a 1.05, and 1.23 DHV adjustment was applied to the June and January weekday evening peak hour data, respectively. Detailed calculations for the DHV adjustments are provided in the Appendix.

Background Growth

Traffic growth is a function of expected land development in the region. To predict a rate at which traffic can be expected to grow during the forecast period, historical traffic growth was examined. The regression analysis for the urban highway group prepared by VTrans suggests that regional short term traffic growth will be approximately flat (i.e. 0 percent annually). Discussions with the City of Burlington planning staff revealed that there were not any other significant developments in the area that would affect traffic volumes. Therefore, it was concluded that an average annual growth rate of 0.75 percent would provide a conservative assessment of traffic growth in the proximate area for this evaluation. VTrans regression analysis is provided in the Appendix.



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0 300 600 1200 Feet

LEGEND

US 7: 5% Site generated trip origin/destination zone

5% Site generated trips on route

City Market Traffic Study

Burlington, Vermont

Sources:
Background Imagery by VCGI (2013)
VCGI (Vermont Center for Geographic Information - 2012)
VTrans (Vermont Department of Transportation - 2014)
VHB - 2016

Figure 5 Trip Distribution With Champlain Parkway



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No Build and Build Traffic Networks

The 2017 and 2022 No Build traffic volumes were developed by applying the average annual growth rate of 0.75 percent per year to the 2014 and 2016 DHV adjusted peak hour traffic volumes. The 2017 and 2022 No Build weekday evening peak hour volumes are shown in **Figures 6-7**.

The directional distribution of site-generated traffic was approximated based on existing travel patterns within the project study area. Pass-by and diverted trip distributions were based on existing traffic flows on the adjacent roadway system. Based on the expected trip distribution, the site-generated trips were added to the 2017 and 2022 No Build peak hour traffic volumes to establish the 2017 and 2022 Build networks. It should be noted that no reduction of traffic was taken for the existing uses on site to provide a conservative evaluation for the Build condition. The Build networks are shown in **Figures 8-9**.

The 2022 forecast year condition was also evaluated with the Champlain Parkway in place. Traffic volume projections from the Southern Connector/Champlain Parkway MEGC-M5000(1) study prepared by CHA were used to establish the forecast No Build traffic volumes with the Parkway in place³. The 2022 No Build and Build forecast year condition traffic volume networks with the Champlain Parkway in place are shown in **Figures 10-11**.

TRAFFIC ANALYSES

Intersection capacity analyses were performed for the study area intersections. Levels of service (LOS) were calculated based on the criteria published in the 2000 Highway Capacity Manual⁴. Level of service is the term that defines the conditions that may occur on a given roadway or at an intersection when accommodating various traffic volume loads. Levels of service range from A to F with LOS A representing generally free flowing operating conditions and LOS F representing the most congested conditions. Copies of the level of service calculations have been provided in the Appendix.

Signalized Intersections

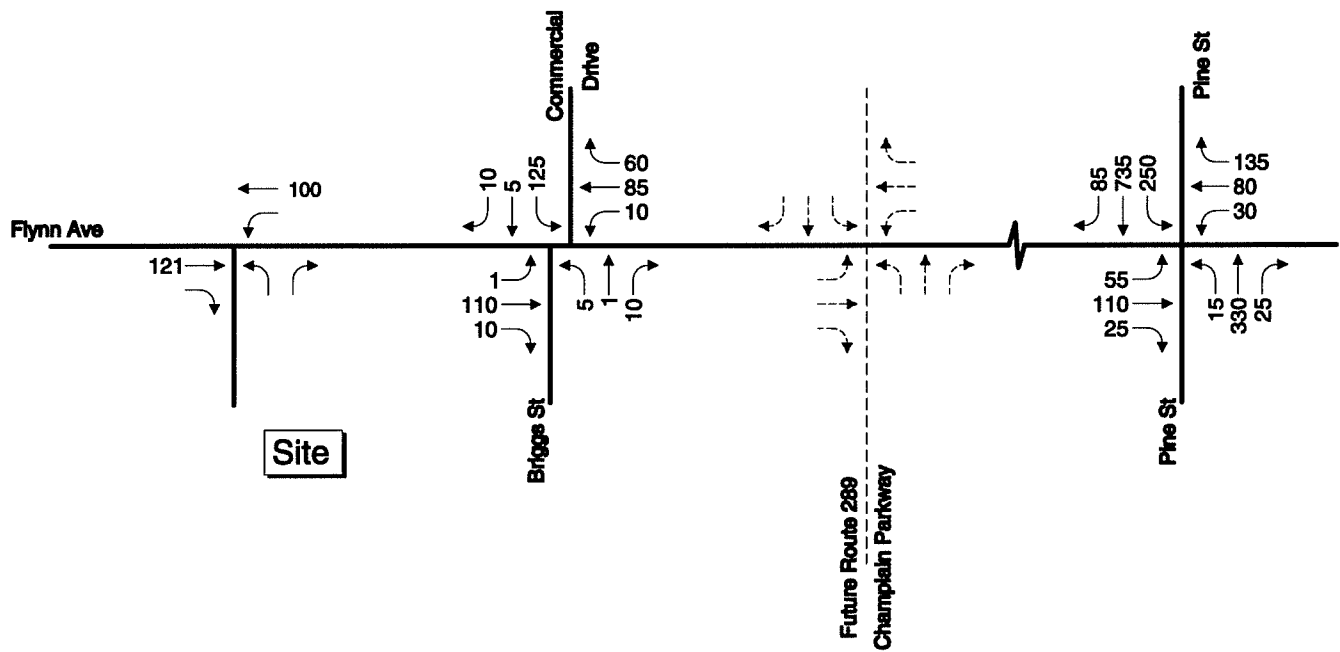
Table 2 summarizes the operational analysis at the *signalized* study area intersections during the 2017 and 2022 weekday evening peak hours under No Build and Build conditions. The results are shown with and without the Champlain Parkway in place in the 2022 condition.

As shown, the intersection of Flynn Avenue at Pine Street is expected to operate at LOS B in both the No Build and Build scenarios, except for the 2022 Build without Parkway scenario, where the intersection is expected to operate at LOS C. Traffic volumes are expected to be diverted from Pine Street to the Champlain Parkway once complete. As a

³ Volumes from the 2009 Champlain Parkway Final Supplemental Environmental Impact Statement scenario, "2028 PM Peak Hour Traffic Volumes C-1 Section & C-2 Section Only" were used as the 2022 No Build volumes for the Pine/Flynn and Flynn/Parkway intersections, under the Champlain Parkway No Build and Build conditions.

⁴ Highway Capacity Manual, Federal Highway Administration, Transportation Research Board, 2000.

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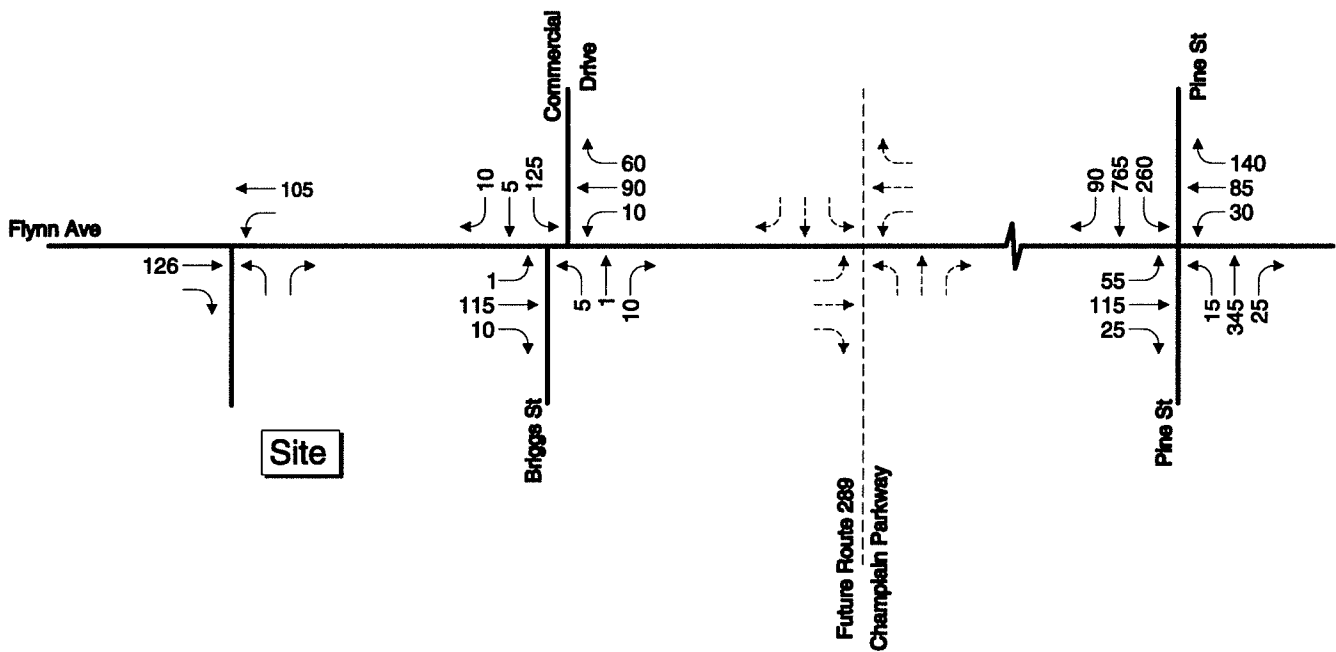


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Figure 6
2017 No Build Weekday Evening
Peak Hour Traffic Volumes

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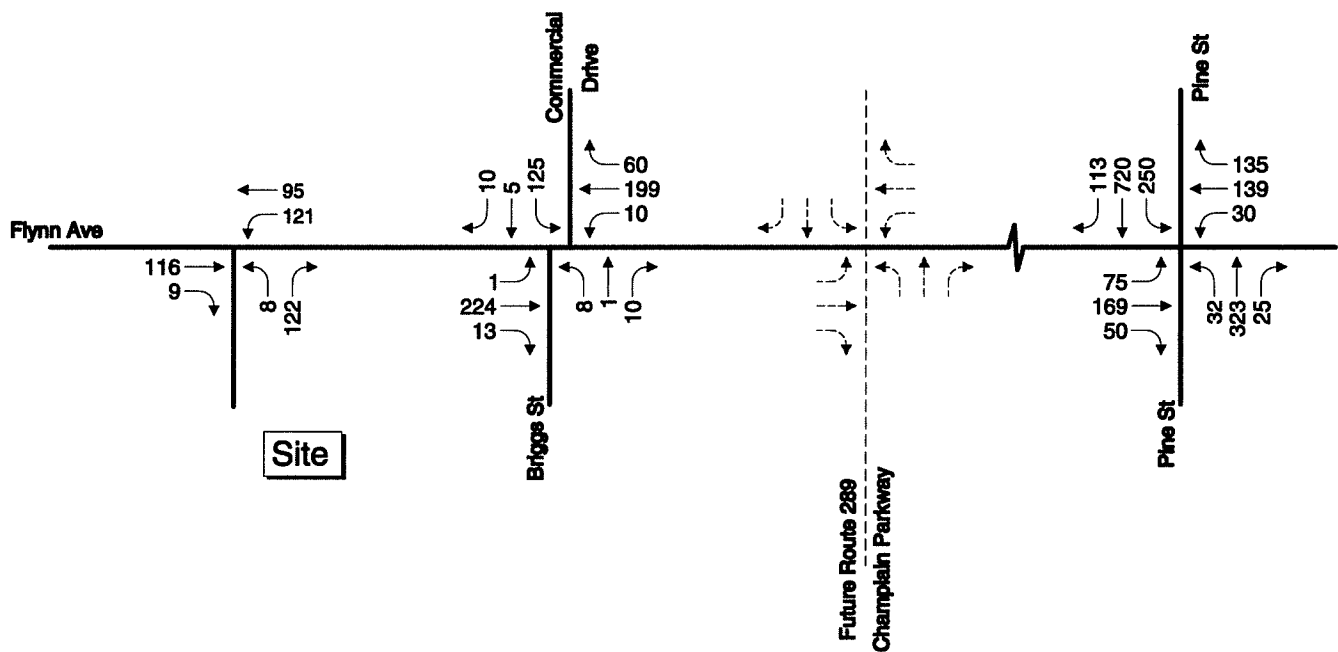


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Figure 7
2022 No Build Weekday Evening
Peak Hour Traffic Volumes

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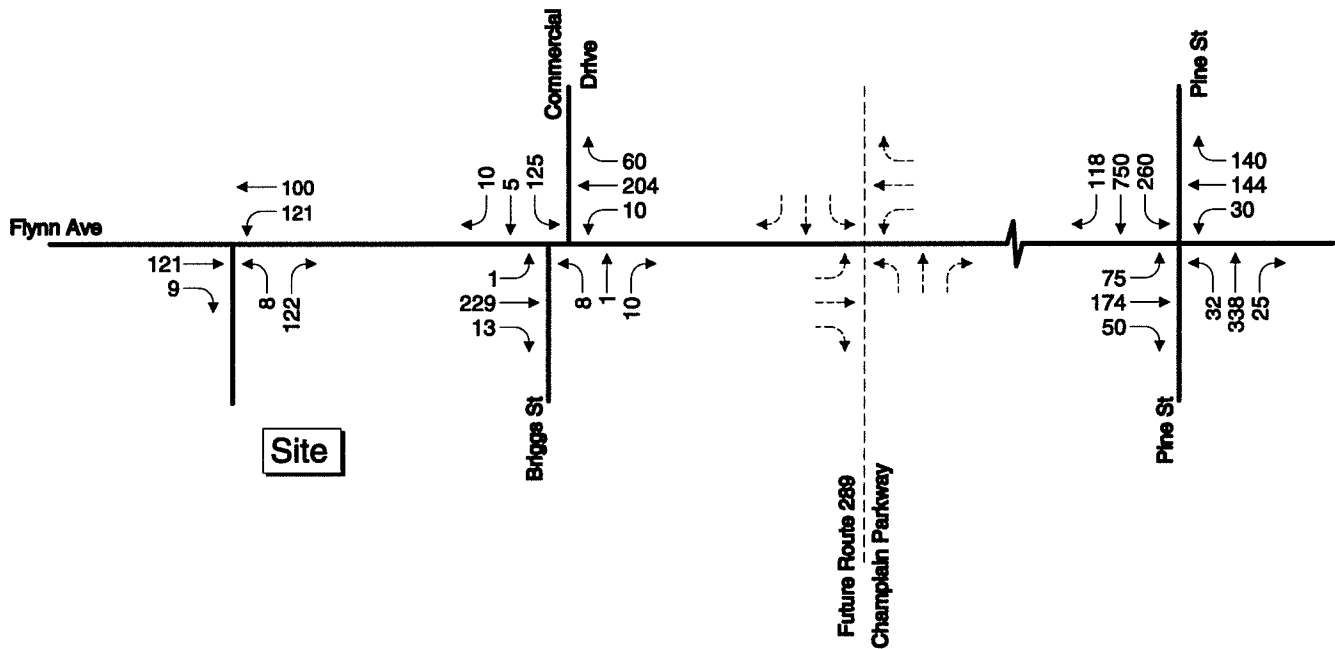


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Figure 8
2017 Build Weekday Evening
Peak Hour Traffic Volumes

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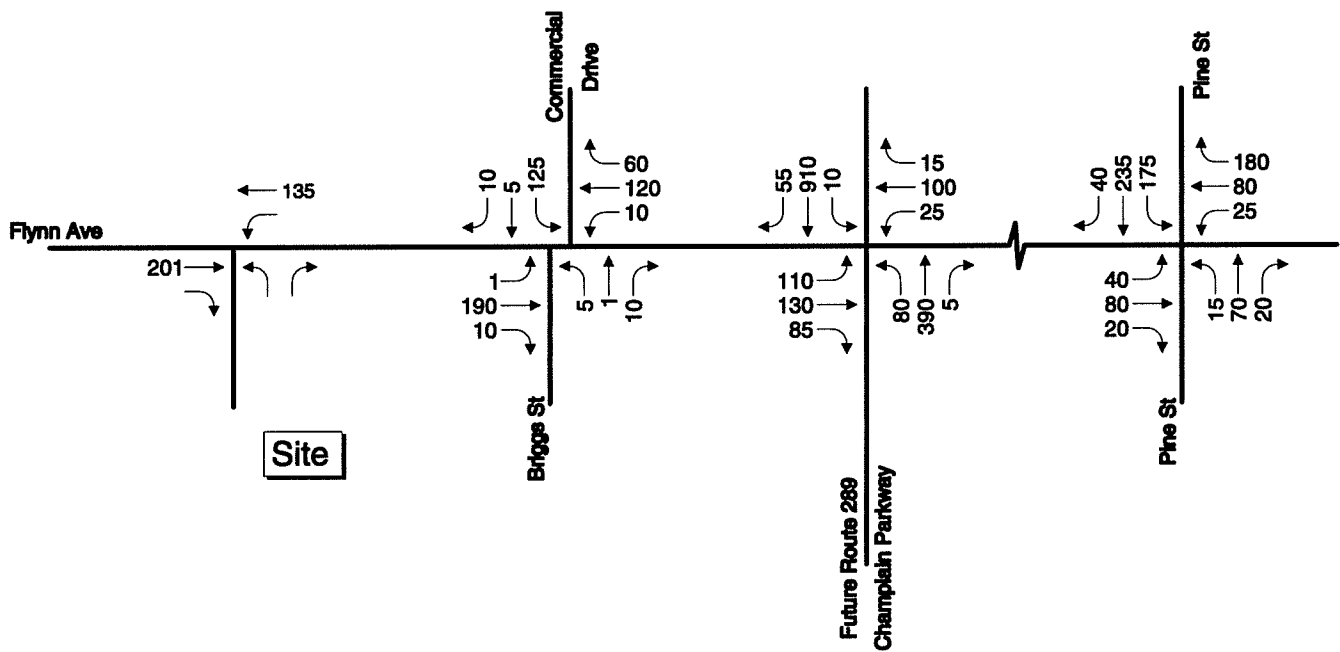


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Figure 9
2022 Build Weekday Evening
Peak Hour Traffic Volumes

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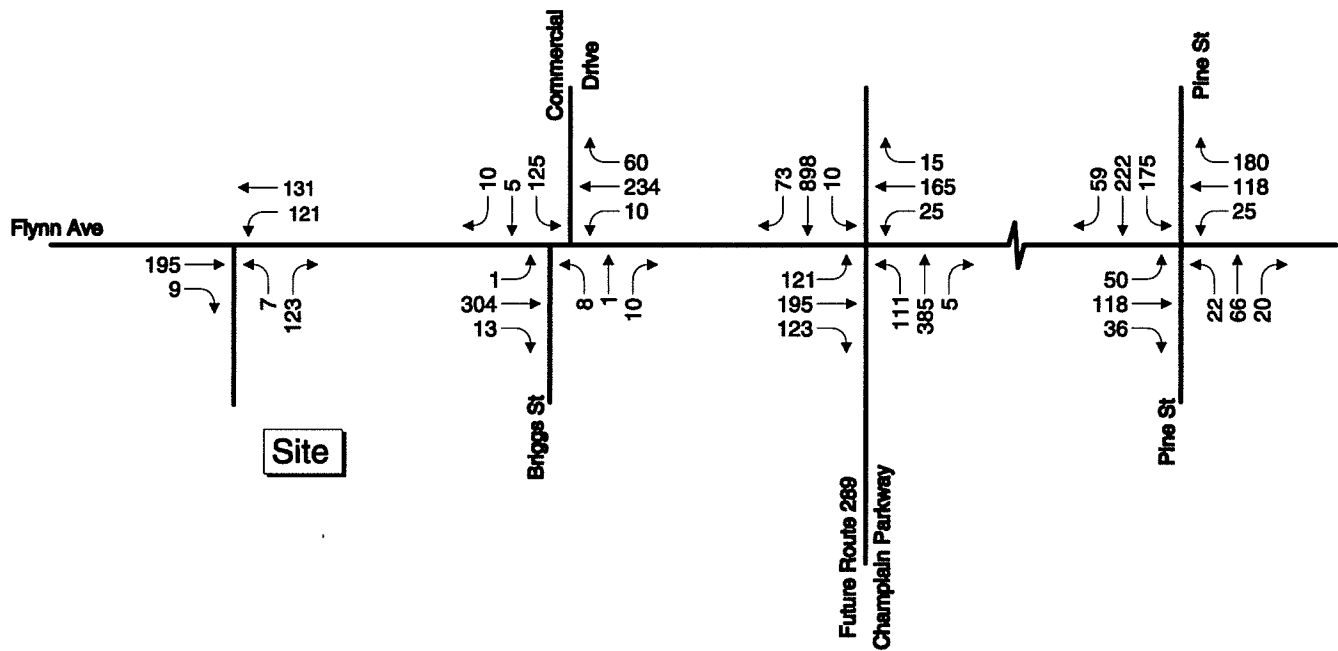


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Figure 10
2022 No Build Weekday Evening
With Champlain Parkway
Peak Hour Traffic Volumes

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Figure 11
2022 Build Weekday Evening
With Champlain Parkway
Peak Hour Traffic Volumes



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result, the intersection of Flynn Avenue at Pine Street is expected to operate at LOS B with or without the proposed development with the Champlain Parkway in place.

The new intersection of Flynn Avenue at the Champlain Parkway is expected to operate at LOS E in the No Build Condition and at LOS F with the proposed development in place.

It is important to note that the signalized intersection analyses for the "with Parkway" condition replicated the traffic volumes, signal timing/phasing, and other Synchro/HCM inputs from the *Southern Connector/Champlain Parkway MEGC-M5000(1) Final Supplemental Environmental Impact Statement (FSEIS)*⁵ to ensure consistency between the analysis conducted for the Parkway FSEIS and this traffic study. In our opinion, the FSEIS Synchro/HCM inputs include several factors and adjustments that result in an overly conservative analysis, notably a Peak Hour Factor adjustment of 0.9 – which effectively increases all volumes (including site generated trips) by 10%. The FSEIS traffic analysis also assumed an exclusive pedestrian phase at the Flynn Avenue / Champlain Parkway intersection. We would anticipate this intersection would likely operate with an advanced concurrent pedestrian phase, similar to most other signalized intersections in the City, resulting in lower delays than those reported below.

TABLE 2: SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

Location	Year (Condition)	No Build PM			Build PM		
		v/c*	Delay**	LOS***	v/c	Delay	LOS
Flynn Ave at	2017	0.83	13	B	0.94	18	B
Pine St	2022 (w/o Parkway)	0.85	13	B	0.88	21	C
	2022 (w/ Parkway)	0.43	10	B	0.47	11	B
Flynn Ave at							
Champlain PKWY	2022 (w/ Parkway)	1.02	73	E	1.16	110	F

* Volume to capacity ratio.

** Delay expressed in seconds per vehicle.

*** Level of service.

w/ Parkway – Evaluation includes the Champlain Parkway (C1 & C2 2-Lane Alternative).

Unsignalized Intersections

Table 3 summarizes the operational analysis at the *unsignalized* study area intersections. All movements at the intersection of Flynn Avenue at Briggs Street and the 208 Flynn Avenue commercial driveway are expected to operate at LOS C or better through the 2022 forecast year with or without the proposed development. The proposed site driveway on Flynn Avenue is expected to operate at LOS B through the 2022 forecast year condition with or without the Champlain Parkway in place.

⁵ 2028 PM Peak Hour Traffic Volumes C-1 Section & C-2 Section Only scenario

It should be noted that the capacity analysis results for the Champlain Parkway condition do not fully account for the proximity of the proposed signal on Flynn Avenue with Briggs Street and the 208 Flynn Avenue site driveway. Potential queuing on Flynn Avenue generated by the Champlain Parkway signal would impact the ability for vehicles to enter Flynn Avenue from Briggs Street and the 208 Flynn Avenue driveway. In particular, access from the 208 Flynn Avenue driveway will be significantly impacted by the proposed signal, given the lack of separation between the driveway and the signal's eastbound stop bar. This condition is attributable to the geometric design of the Flynn Avenue and Champlain Parkway intersection, not to City Market.

TABLE 3: UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY

Location / Movement	2017 No Build PM			2017 Build PM		
	Demand*	Delay^	LOS+	Demand	Delay	LOS
Briggs St at Flynn Ave						
NB movements from Briggs St	15	10	A	20	11	B
SB movements from 208 Flynn Ave	140	12	B	140	15	C
Flynn Ave at Site driveway						
NB movements from Site	-	-	-	130	11	B
Location / Movement	2022 No Build PM (w/o PKWY)			2022 Build PM (w/o PKWY)		
	Demand	Delay	LOS	Demand	Delay	LOS
Briggs St at Flynn Ave						
NB movements from Briggs St	20	10	A	20	11	B
SB movements from 208 Flynn Ave	140	12	B	140	15	C
Flynn Ave at Site driveway						
NB movements from Site	-	-	-	130	11	B
Location / Movement	2022 No Build PM (w/ PKWY)			2022 Build PM (w/ PKWY)		
	Demand	Delay	LOS	Demand	Delay	LOS
Briggs St at Flynn Ave						
NB movements from Briggs St	20	10	B	20	13	B
SB movements from 208 Flynn Ave	160	14	B	160	21	C
Flynn Ave at Site driveway						
NB movements from Site	-	-	-	130	11	B

* Demand in vehicles per hour.

^ Delay in seconds per vehicle.

+ Level of service.

w/ PKWY – Evaluation includes the Champlain Parkway (C1 & C2 2-Lane Alternative).



Memorandum

Proposed Traffic Mitigation

Based on the assessment of existing site conditions, crash data, and existing and projected traffic volumes, no off-site traffic improvements were deemed necessary to mitigate the impacts of site-generated trips in the pre-Champlain Parkway condition.

Several operational improvements were identified to address the LOS F conditions that were encountered at the Flynn Avenue/Champlain Parkway intersection under the 2022 post-Parkway Build scenario. However, it is our understanding that any proposed changes to the currently approved Champlain Parkway FSEIS design (e.g. additional turn lanes, signal timing changes, etc.) would trigger potentially adverse permitting-related impacts and schedule setbacks for the Champlain Parkway project.

Given the overall conclusions of this traffic assessment and permitting-related constraints associated with the Champlain Parkway, the recommended project mitigation has been divided into two categories as follows:

- Traffic Mitigation within City Market's Full Control:
 - Relocate the City Market main site driveway to the west side of the lot with all vehicles entering and exiting via Flynn Avenue (*task complete*). The Briggs Street driveway will be gated and used for emergency access only until the Champlain Parkway is completed, at which point City Market may re-initiate discussions with the City about opening the Briggs Street driveway for general purpose traffic.
 - Based on questions raised by neighbors about the potential for increased cut-through traffic, we recommend that City Market: 1) conduct weekday evening peak hour turning movement counts at selected intersections along Foster, Pine, and Briggs Streets after the opening of the store, and 2) prepare a brief summary comparing neighborhood traffic volumes before and after the opening of the City Market store.
- Potential Post-Parkway Traffic Mitigation Outside of City Market's Control:
 - Restripe the eastbound approach to the Flynn Avenue/Champlain Parkway intersection to add an exclusive right-turn lane (or left-turn lane, if observed volumes and subsequent analysis shows improved performance when compared to an exclusive right-turn lane). Add appropriate vehicle detection, signal hardware, and timing changes to accommodate the new right-turn lane and right-turn overlap phase with the northbound/southbound left-turn phase.
 - Modify the traffic signal phasing at the Flynn Avenue/Champlain Parkway intersection to change from an exclusive pedestrian phase to a leading concurrent pedestrian phase and optimize the signal splits based on field observations (without adversely affecting the overall Parkway coordination).
 - Investigate the opportunities for a new break in access on the Champlain Parkway to permit right-in/right-out access directly from Briggs Street.
 - Investigate opportunities to modify the internal traffic circulation pattern on the 208 Flynn Avenue lot to make the westerly driveway an exit only and the easterly driveway an enter only.



- Investigate opportunities to remove on-street parking spaces along the south side of Flynn Avenue at the approach to Pine Street and place pavement markings to delineate an eastbound right-turn lane at the intersection.

Table 4 below compares the operational performance of the Flynn Avenue/Champlain Parkway intersection under the 2022 Build condition against the performance under the 2022 Build with Mitigation condition (which includes the additional eastbound right turn lane and signal modifications outlined above). As the results show, the improvements considered for the Flynn Avenue/Champlain Parkway intersection under the Build with Mitigation scenario reduce delay and LOS to be generally equivalent with the No Build condition at this intersection.

TABLE 4: SIGNALIZED INTERSECTION CAPACITY ANALYSIS SUMMARY – MITIGATION

Location	Mitigation	2022 Weekday Evening Peak Hour					
		Build			Build w/ Mitigation		
		v/c*	Delay**	LOS***	v/c	Delay	LOS
Flynn Ave at Champlain PKWY	EB right-turn lane w/ overlap phase; Optimized splits; and Leading concurrent ped	1.16	110	F	1.05	73	E

* Volume to capacity ratio.

** Delay expressed in seconds per vehicle.

*** Level of service.

CONCLUSIONS

The proposed redevelopment program consists of demolishing the existing structures on site and constructing a 33,874± square foot City Market grocery store with associated uses. The trip generation estimates indicated that the proposed development will generate approximately 320 trips during the weekday evening peak hour. After accounting for non-automobile trips (e.g. walkers, cyclists, and transit users), pass-by trips, and diverted trips, the proposed City Market is expected to generate approximately 130 *new* vehicular trips during the evening peak hour.

Primary access and egress is proposed on Flynn Avenue approximately 225 feet west of Briggs Street. Emergency vehicle access is provided via a gated entrance off of Briggs Street approximately 500 feet south of Flynn Avenue. Sight lines at the proposed site driveway exceed AASHTO's recommended guidelines.

Prior to the construction of the Champlain Parkway, the site driveway and study area intersections are projected to operate acceptably under both the No Build and Build scenarios. However, given neighbor concerns over increased traffic on adjacent streets, it is recommended that City Market conduct traffic counts in the adjacent neighborhood after project completion and prepare a summary of pre- vs. post-construction traffic levels in the neighborhood.

Following the construction of the Champlain Parkway, the newly created intersection at Flynn Avenue is expected to operate at LOS F conditions during the weekday evening peak hour. While specific improvements to the Flynn Avenue/Champlain Parkway intersection are outside of City Market's control due to Parkway permit implications, it is

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DEPARTMENT OF
PLANNING & ZONING

Memorandum

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recommended that City Market coordinate with the City of Burlington to implement specific geometric and operational improvements at this intersection as detailed in the *Mitigation* section of this report directly following the completion of the Champlain Parkway project. The recommended mitigation improves performance at this intersection to be generally equivalent to No Build conditions.